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TECHNOLOGY DEPARTMENT

# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • JANUARY 25, 1947



Pacarana from Peru

See Page 55

A SCIENCE SERVICE PUBLICATION

## MEDICINE

## Drugs Arrest Myeloma

**Treatment does not cure the bone marrow disease, but temporarily arrests its course and relieves severe pain. Diamidine compounds are used.**

► THE EXCRUCIATING pain of multiple myeloma is relieved and the course of this malignant bone marrow disease is arrested by treatment with two relatively new drugs and a low protein diet, Dr. I. Snapper of Mount Sinai Hospital, New York, reports in the *Journal of the American Medical Association* (Jan. 18).

The treatment does not cure the disease, Dr. Snapper emphasizes. It is temporarily checked in its development. This occurs even in cases in which the disease has been rapidly getting worse before the treatment is started.

The two drugs Dr. Snapper has used are Stilbamidine and Pentamidine. Drugs of this type, which are diamidine compounds not containing antimony, have been successfully used since 1939 to treat the tropical disease, kala-azar. Before their development, antimony compounds were used for kala-azar and for multiple myeloma, leukemia and Hodgkin's disease. The reason for using the same drugs for these different illnesses was that in all of them there may be an increase in the amount of a protein called globulin in the blood serum.

All 15 patients Dr. Snapper has so far treated with either Stilbamidine or Pentamidine and a diet low in animal protein have shown considerable im-

provement. The improvement starts soon after the treatment is started, sometimes after the third or fourth injection.

None of the 15 patients treated so far has had any relapse and all have been relieved of pain. Eleven were able to walk when discharged from the hospital. One has since died of diabetic coma, two others have died of myeloma of the kidney and thrombopenia, respectively, and one had paralysis before treatment was started.

The effect Stilbamidine has in arresting the disease may be due to changes it produces in the chemistry of the myeloma, or tumor, cells. Another investigator, Dr. M. J. Kopac of New York, has reported that this drug destroys cancerous cells of transplantable animal tumors without damaging normal cells. The shape of the nuclei of the tumor cells was changed and cell division was stopped. Dr. Kopac believed the drug had a chemical influence on certain specific nucleoproteins of the cell nucleus.

Dr. Snapper found no change of the nucleoprotein of the nuclei of the myeloma cells in his patients, but did find changes in the cytoplasm of these cells, consisting of precipitates of ribonucleic acid.

*Science News Letter, January 25, 1947*

## AERONAUTICS

## Flying Wing Progresses

► A TWIN-ENGINEED, jet-propelled, tailless plane, built in England by Armstrong Whitworth Aircraft, is now ready for tests in the air. It is a forward step in the development of true all-wing aircraft.

The plane, to be known as A. W. 52, is an experimental craft, one step in a long-term program in which the ultimate objective is a flying wing. It is a result of a five-year research, beginning in 1942 with the design and construction of a full-scale section of a wing suitable for laminar flow drag tests in a wind tunnel.

When tested, this wing section was found to have surface vibration of only

a few thousandths of an inch, and the structure weight was not more than that of an ordinary wing. Further, it was found that the profile drag of the wing section was only half that of standard wings.

The next step taken was the construction of a tailless glider with a 53-foot span and a weight of three tons. After testing the performance of this in the air for some 200 hours of flying time, the A. W. 52 was constructed. It is an all-metal plane with a span of 90 feet, a weight of 15 tons, and a wing area of 1,314 square feet. It is powered by two Rolls-Royce Nene jet engines.

A second version of the A. W. 52, now

under construction, will be powered by Rolls-Royce jet engines of a lighter type. With these there will be no exposed engine nacelles. With the engines completely buried within the body, a further aerodynamic advantage is gained.

Plans for the true all-wing plane are making progress. It will probably weigh about 88 tons. Engineers calculate that this size will be necessary in order that the power units, crew, passengers, freight and fuel may all be contained within the outline of a perfect wing form.

*Science News Letter, January 25, 1947*

## MEDICINE

## New Medical Practice Era Predicted for Near Future

► A NEW ERA in medical practice coming in the near future was predicted by Dean Willard C. Rappleye of Columbia University's College of Physicians and Surgeons in his annual report to the University's president.

The era will be marked by gradual changes in the fundamental form of medical practice. Dr. Rappleye foresees the general community hospital as the future center of all health services, including dentistry. In addition, he believes specialized, tax-maintained hospitals will be needed for conditions such as tuberculosis, cancer, other chronic, incapacitating illnesses, contagious diseases, mental disorders and the crippled and handicapped. General hospitals for the indigent are "recognized almost universally as the responsibility of the government," he added.

The establishment of sound hospital group practice units where needed throughout the country will, in his opinion, have a particular bearing on the important question of the distribution of physicians. This better distribution of physicians, not producing more physicians, is the answer to the problem of providing proper medical services, he declared.

Such units, he pointed out, will prevent what is perhaps our greatest waste of medical manpower under the present set-up, the period of five to 10 years after completion of hospital training when younger physicians are only partly occupied in the early stages of practice. They could be completely occupied if they practiced in small communities or rural districts, but they will not go into such communities unless modern facilities for practice, such as the hospital group practice unit offers, are available.

*Science News Letter, January 25, 1947*



## MATHEMATICS

# Machines Speed Science

Mechanical "mathematicians" are being designed to solve problems too involved for the human brain. Men must be trained to staff machines.

► NEW PLANS for thinking with machines were made by 200 mathematicians and scientists who have been conferring at Harvard University. The "brain" machines that think with numbers will speed scientific investigations, doing some computations that are impractical for the human brain alone to do.

In the new, modernistic building of the computation laboratory of Harvard University, Prof. Howard H. Aiken demonstrated the latest Harvard-built computing machine, the Mark II automatic sequence control calculator.

Automatic digital computing machines think with numbers. Once set up to work a problem, the machine without human intervention can perform the thousands of lightning additions or multiplication to give answers to problems that were hitherto too long or involved for any practical method of solution.

## Problems for Machine

How does the air flow around a projectile travelling faster than the velocity of sound? What is the relation between profits, wages and prices, given the hundreds of complicated interrelations between costs and productions? These are but two examples of the problems that are expected to be solvable by the many machines that are now built or being built.

By translating the principles involved in counting on your fingers into complex machines of wires, electron tubes, magnetic wire recorders, photographic films, relays, phosphorescent-coated discs, teletypewriters and printers, and even sound waves in tubes of mercury, the engineers expect to perform such computations.

The biggest problem in these machines is the finding of a good, cheap way of storing the hundreds of thousands of numbers involved in a big problem, and yet having this stored content available on a split second notice. In hand computation, simply writing the numbers on a piece of paper is sufficient. But for a machine which may generate millions of numbers in intermediate steps, and at

a rate a thousand times faster than the speediest human calculating machine operator, the method would use up too much paper. Storage of numbers by the hundred thousand on miles of magnetized wire or on microscopic patterns on photographic film was discussed.

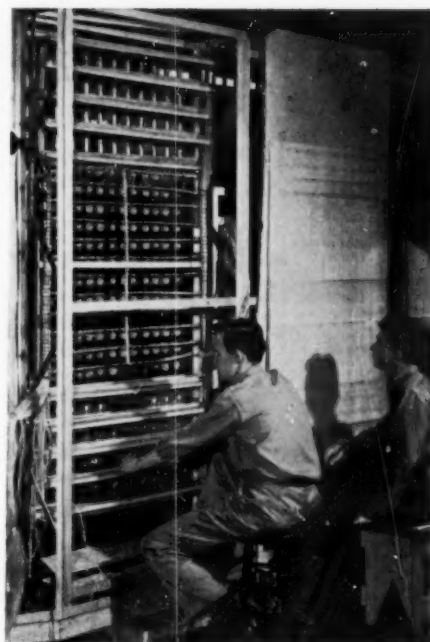
## Rapid Memories

When you add or multiply, you temporarily hold one or two digits in your head. But these machines are designed to hold in their "rapid memories" as many as a thousand numbers, each ten or more digits long; and to be able to think of any one of these numbers, to do the next step of a problem in a thousandth of a second.

One suggested solution of these problems included the use of tiny patterns of electric charges on the insulating inner surface of electron beam tubes. Another was the use of a sort of telegraph code—at a million dots per second—which would be put as acoustic pips into a tube of mercury where a thousand pips can be stored before the first one emerges at the far end. When the pips come out, one at a time, they can be put back into the other end of the same tube for the next round of storage. They are always on the go, but they never get anywhere. Numbers have been stored in such a fashion for days, to take the load off the mathematician. This is the purpose of the new digital machines.

But then you cannot have the machine stopping every so often to ask questions of the mathematician. There are ways to make the machine think for itself, to size up the problem and the steps that it has just finished, and from this to make its own decisions on how to go ahead with the thousands of steps ahead of it. These were discussed by Dr. H. H. Goldstine of the Institute of Advanced Study.

With machines that can compress a lifetime of computation into a few days or weeks, the problem of handling the huge output of answers is acute. Harrison Fuller of Harvard University demonstrated the most unusual proposal for



**MARK II**—This picture shows the calculator under construction at Harvard University.

the solution of this problem. He showed that with a few dozen vacuum tubes he could actually write Arabic numerals on the face of a cathode ray tube. By pressing any one of 10 buttons, one of each of the ten digits appeared on the face of the tube, written as if by a pencil of electrons. Twenty of these tubes in a row could then display a number 20 digits long. With suitable equipment, these numbers could be recorded photographically on a sheet in a form suitable for immediate photo-printing processes.

## Demonstration of Mark II

The demonstration of the new Mark II calculator was a feature of the four-day meeting. With thousands of relays interconnected with a million feet of wire, it is one of the biggest computing machines in the world. This machine was built for use at the Naval Proving Grounds, Dahlgren, Va., where it will provide answers to the many problems of guided missile flight, bomb trajectories and shell characteristics. The machine is 12 times faster than the Mark I machine which was built at Harvard and presented to the University by the International Business Machines Corporation in 1944.

Prof. Charles C. Bramble of the Post Graduate School, Naval Academy, Annapolis, Md., sounded a call for the immediate training of young mathematicians.

(Turn to page 52)



**AAAS WINNERS**—Dr. Quentin M. Geiman and Dr. Ralph McKee (top), department of biochemistry, Harvard Medical School shared in \$1,000 prize of the AAAS meeting with Prof. T. M. Sonneborn and Ruth V. Dippell, research associate, both of Indiana University. The winning papers were, respectively, "Cultural Studies on the Nutrition of Malarial Parasites" and "Paramycin 51." (See SNL, Jan. 11, 1947.) Chemical and Engineering News photographs.

### From Page 51

ticians in the operation of the many new computing machines now building, lest the construction of the machines outrun the supply of operators trained to use them.

This call was seconded by Prof. Aiken, who stated that a university was for the building of men, not machines, and that the number of young men now trained

in the field was far too small. He expressed his intent to initiate courses in the fall in applied mathematics with a strong flavor of computing machines.

The snowballing of interest in automatic digital computing machines is vividly demonstrated by their history. Before the war, only the Bell Laboratories Relay Computer was in existence. In 1944, the IBM-Harvard automatic sequence controlled calculator was put

into operation. In 1945, the electronic numerical integrator and computer, called "Eniac," was unveiled at the University of Pennsylvania. Now there are about a dozen projects planned or underway.

The Navy, through the Office of Naval Research, plans to establish institutes for numerical analysis, one on the east and one on the west coast, it was announced by A. T. Waterman, speaking for ONR. These centers, which will use the latest machines, will be placed near large cooperating universities and will encourage outside scientists to become temporary staff members.

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## GENERAL SCIENCE-EDUCATION

# 40 Science Talent Winners

Nine girls, 31 boys are invited to Washington to attend the Science Talent Institute and compete for scholarships totaling \$11,000.

► NINE GIRLS and 31 boys have been invited to Washington, D. C., Feb. 28 through Mar. 4, to compete for the Westinghouse Science Scholarships in the Sixth Annual Science Talent Search conducted by Science Clubs of America, administered by Science Service. They will spend five days together at the Science Talent Institute in Washington.

The names of the trip winners were announced by the judges as the result of a strenuous competition in which superior seniors of all secondary schools in the United States were invited to participate. The 40 winners were selected from 16,558 entrants. Of these students, 3,197 completed a science aptitude examination, submitted recommendations and scholarship records and wrote an essay on "My Scientific Project".

## 16 States Represented

The trip winners come from 32 localities in 16 states and the District of Columbia. Entries were received from every state in the union.

Those who come to Washington for the Science Talent Institute, Feb. 28-Mar. 4, on the all-expense trips, will compete for scholarships which will allow them to go to any college, university or technical school of their own selection to continue science or engineering training. One boy and one girl will be awarded \$2,400 Westinghouse Grand Science Scholarships (\$600 a year for four years), while eight winners will be awarded \$400 Westinghouse Science Scholarships (\$100 a year for four years), and \$3,000 more in Westinghouse Science Scholarships will be awarded at the discretion of the judges.

Selected without regard to geographic consideration, the results show that this year winners come from two states that have not had winners before. Massachusetts and New Hampshire have winners in their public schools this year for the first time. This brings the total of states that have had winners to 34.

Only two schools in the United States have produced more than one winner this year. Stuyvesant H. S., New York, N. Y. will send three boys, and the Bronx H. S.

of Science, New York, N. Y. will send two boys to the Science Talent Institute.

Ten schools have been able to repeat winners. The Bronx H. S. of Science, New York, N. Y. leads, having had seven winners in three previous years. Stuyvesant H. S., New York, N. Y.; Bassick H. S., Bridgeport, Conn.; and Eugene H. S., Eugene, Oregon, have each had two winners in previous years. The following schools have had one winner before in the Science Talent Search: Erasmus Hall H. S., Brooklyn, N. Y.; Roosevelt H. S., Washington, D. C.; Cheltenham H. S., Philadelphia, Pa.; Alexander Hamilton H. S., Los Angeles, Calif.; College H. S., Upper Montclair, N. J., and William Howard Taft H. S., New York, N. Y.

All of the winners live at home and attend their local or nearby public, private, or parochial high schools.

Of the 40 Science Talent Search trip winners 72.5% rank first or second in their graduating classes, which range in size from 13 to 750 students. About 17% of the winners have parents who attended college.

Most of the winners are members of science clubs and at least 11 of them are presidents or hold other offices in their clubs. The total number of science clubs in which they work is 70; of these 29 are affiliated with Science Clubs of America.

Many of the winners have chosen their fields of science study. Their choices range from biochemistry to theoretical physics. Eight hope to get into the field of medicine. Fourteen are choosing to enter chemistry for research or engineering. Others want careers in mathematics, mineralogy, physics, electronic engineering, geology, and zoology. All plan to do research in their chosen fields.

## Judges of STS

The judges of the Science Talent Search are: Dr. Harlow Shapley, director of the Harvard College Observatory and president of Science Service; Dr. Harold A. Edgerton, professor of psychology, Ohio State University; Dr. Stuart Henderson Britt, psychologist, New York City, and Dr. Rex E. Buxton,

psychiatrist, Washington, D. C. Drs. Edgerton and Britt design the Science Aptitude Examination each year for the Science Talent Search.

In addition to the 40 winners of trips to Washington for the final competition for the Westinghouse Science Scholarships, 260 boys and girls will be named for honorable mention in the Sixth Annual Science Talent Search. They will be recommended to colleges and universities for their science aptitude and, if they are as fortunate as those previously named for this honor, they will receive offers of scholarships from many schools and colleges.

Previous winners chosen in the Science Talent Search total 200. Most are now students in colleges and universities where they are preparing themselves for scientific careers. Many have already received one or more college degrees and six are working on their Ph.D. degrees. None is more than 23 years of age.

The annual Science Talent Search is conducted by Science Clubs of America, administered by Science Service. Scholarships are provided and the Science Talent Search made financially possible by the Westinghouse Educational Foundation, an organization endowed by the Westinghouse Electric Corporation for the purpose of promoting education and science.

*Science News Letter, January 25, 1947*

## ENGINEERING

## Steam Reconditioner Makes Old Surfacing Re-Usable

► WITH THOUSANDS of miles of war-worn and neglected highway and street pavements to be replaced, more than usual interest attaches to a steam reconditioner for bituminous binder material, making possible the re-use of old surfacings. This machine, the invention of W. F. Chester of Bayside, N. Y., is protected by patent 2,413,908.

It is of quite simple construction, consisting of a sealed hopper containing a superposed series of perforated steam pipes in grid-like patterns. The broken-up pavement material is thrown into this, and the steam, at fairly high pressure and temperature, digests the bituminous binder out of the mass. At the same time, new pavement materials are added. Preliminary analyses are necessary to determine the needs for each stretch of road.

*Science News Letter, January 25, 1947*

A film of dust on an electric light bulb may absorb 20% of the light.

## GENERAL SCIENCE-EDUCATION

# 40 Winners to Compete

Nine girls and 31 boys (proportion determined by ratio of boys and girls entering the contest) are being invited to Washington, D. C., for an all-expense trip Feb. 28 to Mar. 4, 1947, to attend the Science Talent Institute. Here one boy and one girl will be awarded \$2,400 Westinghouse Grand Science Scholarships. Eight winners will be awarded \$400 Westinghouse Science Scholarships and \$3,000 additional in scholarships will be awarded at the discretion of the judges.

<b>CALIFORNIA</b>		
Bakersfield	Self, Cecilia Maud	15 East Bakersfield High School
Los Angeles	Halverson, Phillip Carl	17 Alexander Hamilton High School
Pasadena	Kamb, Walter Barclay	14 Pasadena Junior College
<b>CONNECTICUT</b>		
Bridgeport	Nagy, Irene Elizabeth	17 Bassick High School
Greenwich	Gregory, Clarence Leslie, Jr.	16 Brunswick School
<b>DISTRICT OF COLUMBIA</b>		
Washington	Shappirio, David Gordon	16 Roosevelt High School
<b>ILLINOIS</b>		
Chicago	Addleman, Mary	16 Aquinas High School
	Wilt, James William	16 De La Salle High School
Mt. Sterling	Briggs, Marilyn Louise	17 Mt. Sterling Community High School
Urbana	Smith, Norman Harkey	16 University High School
<b>MAINE</b>		
Orono	Cloke, Paul LeRoy	17 Orono High School
<b>MASSACHUSETTS</b>		
Newtonville	Karplus, Martin	16 Newton High School
<b>MINNESOTA</b>		
St. Paul	Gordon, Milton Paul	16 Central High School
<b>NEW HAMPSHIRE</b>		
Lebanon	McKenna, James	17 Lebanon High School
<b>NEW JERSEY</b>		
Cliffside Park	Cole, Irwin Harold	17 Cliffside Park High School
Clifton	Hayes, John Richard	17 Clifton High School
Upper Montclair	Pike, John Nazarian	17 College High School
<b>NEW YORK</b>		
Albany	Cooley, Robin	17 Albany Academy for Girls
Brooklyn	Bieber, Herman	16 Erasmus Hall High School
	Mattuck, Arthur Paul	16 Midwood High School
Buffalo	Inman, Charles Gordon	17 Bennett High School
Eden	Rennagel, William Robert	16 Eden Central High School
Huntington	Demerec, Vera Radoslava	16 Huntington High School
New York	Cooper, Leon N.	16 Bronx High School of Science
	Radack, Herbert Brahm	16 Bronx High School of Science
	Felsenfeld, Gary	17 Stuyvesant High School
	Taylor, Leonard Stuart	17 Stuyvesant High School
	Zemach, Ariel	16 Stuyvesant High School
	Semiat, Paula B.	17 Wm. H. Taft High School
Perry	Relyea, Douglas Irving	16 Perry High School
<b>OHIO</b>		
Cincinnati	McLeish, William Lee	17 Plainville High School
Waynesfield	Emrick, Donald Day	17 Waynesfield High School
Willoughby	House, Herbert Otis	17 Willoughby Union High School
<b>OREGON</b>		
Eugene	Christensen, Dorothy Jean	16 Eugene High School
<b>PENNSYLVANIA</b>		
Philadelphia	Eisenberg, Jerome Martin	16 Central High School
	Kopple, Kenneth David	16 Cheltenham High School
<b>TENNESSEE</b>		
Nashville	Maynard, Donald More	17 Peabody Demonstration School
<b>WASHINGTON</b>		
Hunters	Anthony, Katherine Virginia	19 Hunters High School
<b>WEST VIRGINIA</b>		
Sissonville	Simmons, Gustavus James	16 Sissonville High School
<b>WISCONSIN</b>		
Reedsburg	Haugh, Eugene Frederick	17 Reedsburg High School

## AERONAUTICS

## New Types of Planes Predicted for 1947

➤ MORE NEW types of aircraft than in any prior year in American air transportation will take to the air in 1947, the Society of Automotive Engineers in Detroit was told by R. C. Loomis of Trans World Airline, Kansas City. Better engines will feature them.

Improved engines, making use of war-born devices, will give them speed and economy. Fuel injection systems will be used for purposes of fuel economy, reduced engine vibration, freedom from icing and improved cooling. The use of the small exhaust-turbo-supercharger on the new Boeing Stratocruiser will increase speeds at 25,000-foot altitude by 50% over sea level speeds, he declared.

No gas turbine engines will be used to power commercial aircraft during 1947, but much development work will be done in applying turbine-propeller powerplant combinations to commercial planes for later use. New aircraft models must be designed to take care of turbo-jets, he asserted, so that their use must be considered three years away.

*Science News Letter, January 25, 1947*

## MINING

## New Clay Analysis Methods Often Detect Minerals

➤ THE CLAYS in the vicinity of hidden mineral deposits are now being used to betray the presence of the ore, thanks to X-ray, the electronic microscope, thermal analysis methods, and the old-time chemical analysis for traces of the mineral.

The technique employed is known as "alteration study." Its extended use in searching for new deposits of minerals to replace depleted reserves was revealed by Prof. Paul F. Kerr, of Columbia University, who is partly responsible for its development and who has used it for the past five years.

Particular attention in alteration study, he states, is paid to the processes of nature that have destroyed original rocks and left in their place clay and various other types of alteration material. A determination of their mineral contents furnishes the clue that leads to the mineral deposits. When the alteration study technique is further developed, he predicts, it will be a valuable weapon in the search for new mineral deposits.

*Science News Letter, January 25, 1947*



## MINERALOGY

## New Field Kit Designed For Uranium Prospectors

► A NEW FIELD kit for uranium prospectors has been devised by T. R. P. Gibb, Jr., and Howard T. Evans at Massachusetts Institute of Technology.

The instrument will give semi-quantitative determinations of traces of uranium. Instrument including batteries is housed in a plywood case six by seven by 10 inches and weighs just under five pounds. A gasoline blow torch and portable balance are used with it.

The instrument is an adaptation of a method for determining traces of uranium developed by scientists abroad. It involves the spectrophotometric measurement of the brightness of the fluorescence of a sodium fluoride bead containing traces of uranium presumed to be in solid solution. The sodium fluoride bead is used in a stationary instrument devised by the Technology scientists. In the field kit they substituted for the sodium fluoride bead a cast disc of more fusible material and use a simple visual comparator. Details are reported in *Science* (Jan. 17).

*Science News Letter, January 25, 1947*

## ZOOLOGY

## Rare Pacarana Now Lives At Philadelphia Zoo

See *Ant Cover*

of the world's rarest mammals, pacarana, a white-striped rodent about the size of a groundhog, is now proudly being displayed by the Zoological Society of Philadelphia.

Rare even in its native Peru, the pacarana came to the zoo from an animal dealer, who wrote, "You may know what it is." Only three or four pacaranas have ever reached this country alive, and this one is believed to be the only one now in an American zoo.

Tame as a kitten, the pacarana has a broader head than the groundhog, with a sizable tail and white stripes on dark brown ground color. The pacarana makes a cheerful grunting noise and eats sitting erect on its hind legs.

The pacarana was first discovered in Peru by surprised natives in 1873. An early account of the animal described it as a fierce monster, but it has since been found to be peaceful and timid.

*Science News Letter, January 25, 1947*



**POLE OF GENEALOGY**—This totem pole of northwest-coast Indians, bought in British Colombia from the last survivor of the "Seaweed" clan of the Tlingit tribe for two cases of whiskey, was brought to the University of New Mexico by Prof. Frank C. Hibben of the department of anthropology. Besides the Seaweed coat of arms, the pole depicts the genealogy of the clan and a Seaweed man.

## GENERAL SCIENCE

## Science Congress in India

New epoch in history of India is organization of Association of Scientific Workers whose president is Pandit Jawaharlal Nehru.

► THE ACCEPTANCE of the presidency of the newly created Association of Scientific Workers of India by Pandit Jawaharlal Nehru, leader of the dominant Congress Party, is taken as marking a new epoch in the modern history of India.

The All-India Science Congress, recently held in Delhi, has also worked under Nehru's chairmanship, and he has amply demonstrated that his conception of the new India is a state that depends heavily on modern science and technology, states Dr. Harlow Shapley, director of Harvard College Observatory.

Specially invited foreign delegates included five Americans, three Canadians, nine British, two French, four Russians and one Chinese scientist.

The lectures by foreign scientists were so feverishly attended that a huge tent with loud-speakers was provided. Five

hundred sat on rugs in the aisles when Dr. Shapley spoke on galaxies. A cabinet minister introduced him on that day, and on the following day Pandit Nehru introduced Dr. P. M. S. Blackett of England and Dr. Shapley for reports on the interrelations of science, society, and government in their respective countries.

"Regretfully," stated Dr. Shapley, "I had to report that no government official in America attends science congresses, and that it was apparently left to the governments of India and Russia to lead in the recognition of the role of science and technology in shaping the future."

"The first concern of the scientists in the new Association of Scientific Workers of India," Nehru said in accepting the first presidency, "is in behalf of the people of India, and secondly, for the welfare of the scientists themselves."

*Science News Letter, January 25, 1947*

## MEDICINE

**PABA and Salicylates Give Rheumatic Fever Treatment**

► **BETTER** treatment for rheumatic fever may result from an innovation suggested by Dr. Hugh R. Butt of the Mayo Clinic. This consists in giving para-aminobenzoic acid, a member of the vitamin B complex familiarly known as PABA, with salicylates, drugs used for rheumatic fever treatment for three-fourths of a century.

Good results with this combined PABA and salicylate treatment in the first patient it was tried on are reported by Dr. Butt and Drs. Thomas J. Dry and Charles H. Scheifley in the Proceedings of the Staff Meetings of the Mayo Clinic.

PABA, they found in this case and in two control experiments on healthy men, increases the amount of the salicylate in the blood and therefore, presumably, gives this drug a better chance to combat the rheumatic fever.

*Science News Letter, January 25, 1947*

## METEOROLOGY

**Thunderstorm Study Planned for Ohio Area**

► **FRONTAL TYPE** thunderstorms of the Middle West are to be studied by Army planes equipped with radar and other weather instruments, the U. S. Weather Bureau revealed.

It is a joint project, to be based at the Clinton County, Ohio, Army air field, in which the Bureau, the Army and the Navy will cooperate. The National Advisory Committee for Aeronautics and certain universities will also join in the research.

Frontal type storms are common from the Rockies to the Atlantic seaboard during certain months of the year, the Bureau states. They are caused by the passage of cold fronts or cold air masses over areas that have been subjected to warm air masses. These types of thunderstorms are usually more violent than the convectional or radiation types common in Florida, already studied by the same agencies.

The project will cover a 450-square mile area southeast of Wilmington, Ohio, which is adjacent to the Army field. Operations will begin about the first of April and continue until October. The data collected should prove of great importance to aviation, farmers, business and the general public. The project in general will follow the proce-

dures of the similar Florida study of last summer.

In addition to the use of Black Widow Army planes to be used in observations in the air, some 60 land-based stations will be established, encompassing the area. The Army planes, carrying a Weather Bureau observer and Army radar operator, will fly through the storms. Light-powered Navy planes will circle the storms, and also fly through bulging cumulus clouds, to measure storm characteristics.

*Science News Letter, January 25, 1947*

## AERONAUTICS

**Portable Lighting System Aids Safe Night Landings**

► **PRIVATE PLANES** using small-town airfields will be able to make safe night-landings with the help of a new portable lighting system revealed by Westinghouse at its lighting division plant. The relatively inexpensive system requires only one attendant.

The system includes a beacon, floodlights, landing strip markers and a wind cone. The key of the system is a two-wheel trailer which carries an electric generator and from two to four powerful floodlights, depending upon local needs. The trailer can be pulled by one man or towed by a car.

In use, the trailer with its floodlights is placed at one end of the runway with its beams directed down the landing strip. The beams light up reflecting runway markers which are stuck in the ground at about 100-foot intervals. These markers, shaped like croquet wickets, are made of wire covered with cloth that is impregnated with particles of glass. The shining glass clearly outlines the landing strip to the approaching plane.

When the wind changes in direction, one field attendant can relocate the entire equipment in a short while by merely moving the floodlight trailer and the runway markers.

The beacon used with the system is three and a half feet high, and can be mounted on a hangar or an inexpensive tower. Its 500-watt tubular lamp produces two brilliant 100,000 candlepower beams, visible 10 miles in normal weather, which are directed by lenses on opposite sides as the beacon revolves six times a minute. A duplicate lamp and lens system in the beacon is available as a standby. The eight-foot wind cone is mounted on a hinged pole and lighted by four 100-watt lamps.

*Science News Letter, January 25, 1947*

**IN SCIENCE**

## PHYSICS

**Loud-Speaker System Is Used on Train**

► **DETAILS ARE** now revealed of a loud-speaker system to be used on a new Baltimore and Ohio train by means of which all passengers will be at all times within reach of the conductor's voice announcing from any one of several locations.

The same device will also bring radio programs, when not in use for other purposes. The train is for regular runs between Baltimore and Cincinnati by way of the nation's capital. Each car is equipped with two loud-speaker units, one power amplifier, and a rotary converter.

Microphones for the use of the conductor, stewardess and dining car steward are located at the buffet lunch counter, the conductor's desk in the club car, the stewardess' compartment in the first coach, and the dining car. Transmission through the train is by four wires running the length of the train and connected through regulation train connectors.

Radio receivers are in the same locations as the microphones. By means of a simple switch, a radio program can be cut at any moment to give way to another announcement.

*Science News Letter, January 25, 1947*

## BACTERIOLOGY

**Essence of TB Resistance May Be Isolated**

► **THE MATERIAL** in the tuberculosis germ essential for producing resistance to the germ may have been isolated by Dr. Nine Choucroun at Cornell University Medical College.

It is a complex of starch and fat material that is soluble in chloroform. The material was obtained in a paraffin-oil extract of dead tuberculosis germs. Dr. Choucroun reports in *Science* (Jan. 10).

Animals injected with this material in oil "showed an excellent acquired resistance against infection when they received living bacilli (tb germs) more than three months after they were injected.

*Science News Letter, January 25, 1947*



# THE FIELDS

## AERONAUTICS

### Helicopters to Shuttle Passengers to Airports

► **HELICOPTERS** that have proved their worth in shuttling mail from city post-offices to neighboring airports are now entering a new job. They will be used to shuttle passengers from suburban cities to mainline airports used by long-range transports.

A large-capacity Sikorsky craft will be tested in this service this spring by United Airlines, and additional craft will probably follow the tryout. Other companies are understood to have similar plans. The proposed service is for the benefit of important communities at which landings by commercial transports cannot be made economically.

The helicopter ordered by United Airlines can carry a pilot, three passengers, baggage and 250 pounds of cargo. As an all-cargo plane it can carry 790 pounds.

*Science News Letter, January 25, 1947*

## ENGINEERING

### New Floor Construction Gives Stronger Bridges

► **STRONGER** bridges with lighter steel beams in their concrete flooring are possible with a new type of floor construction, the American Society of Civil Engineers was told by C. P. Siess of the University of Illinois. It is called "composite construction."

This new construction utilizes a design which provides rigid connection between the concrete slab that forms the roadway of the bridge and the steel I-beams on which it rests. This is accomplished by welding steel clips to the tops of the beams and embedding them into the concrete as it is poured.

This method enables bridge builders to obtain greater stiffness in their structures, and to save up to 30% in the weight of steel beams used. It often permits the use of a shallower beam. Even with a lighter section, he said, the stiffness of the composite beam will be from two to three times as great as the stiffness of the original non-composite beam.

*Science News Letter, January 25, 1947*

## MEDICINE

### Purest Polio Virus Yet Gives Hope of Vaccine

► **THE PUREST POLIO** virus yet obtained has been isolated by Drs. Hubert S. Loring and C. E. Schwerdt of Stanford University.

The virus is 80% pure or better, the scientists state in announcing their achievement.

With a relatively pure virus obtainable there is hope of producing an effective vaccine against infantile paralysis, but it may be a long time before the hope is realized.

One apparent obstacle to speedy production of a vaccine is the small yield of virus. Only about a thousandth part of a gram of virus, or 0.000035 ounce, is obtained from 150 grams (about five ounces) of starting material, which is the brain and spinal cord of cotton rats infected with infantile paralysis.

High speed centrifugation, near-freezing temperatures and chemical treatment are used in isolating the virus. Seen with the electron microscope, it appears as a relatively spherical particle so tiny that its diameter is estimated as 25 billionths of a meter. Chemically, the virus reacts as a protein.

Experiments leading to its isolation in 80% purity were financed by the National Foundation for Infantile Paralysis with dime contributed by the American people. Technical assistance was given by Patricia Ruth Schwerdt, Dr. Schwerdt's wife; Madeline Brill, Nancy Lawrence, and Dr. Jane Anderson.

*Science News Letter, January 25, 1947*

## CHEMISTRY

### "All-Weather" Paper Finds Peacetime Uses

► **"ALL-WEATHER"** paper which preserved wartime maps through water, mud, grime and oil in all theaters of World War II will find many important peacetime uses, scientists at the National Bureau of Standards, who helped develop the paper, predict.

Some of the possible uses for the strong, tough paper are to wrap such varied items as wet fruits and vegetables or radio parts, to make strong bags and sacks, and for outdoor advertising.

Secret of the high wet-strength of the map paper is a colloidal solution of melamine-formaldehyde resin added to the pulp. This resin bonding process

helps the paper stand up under conditions which would disintegrate conventional types of paper. Best results were obtained in experiments by using fiber "furnishes" of 100% bleached sulfate pulps. Opacity, the ability to resist light rays, was achieved by adding titanium dioxide.

A light-weight type of map paper was developed late in the war to save space and weight in air shipment. This paper saved an estimated 25% in shipping weight and bulk.

Experiments are now being conducted at the Bureau of Standards to produce papers with even wider uses than the wartime map paper.

*Science News Letter, January 25, 1947*

## INDUSTRY

### 1946 Rubber Production Greatly Decreased Shortage

► **THE 66,000,000** passenger car tires produced by American companies during 1946 brought joy to hundreds of thousands of car owners, but there are other users of rubber whose demands were met to the same degree. They range from doctors to coal miners.

Rubber products in the public health field are particularly important for surgical goods, hospital sheeting, rubber drug sundries, and protective rubber footwear and clothing. Rubber in industry is important, ranging in uses from packing material to great conveyor belts, with large quantities employed for electric insulation.

Achievements of the rubber industry in production during 1946 to meet backlogs in orders were revealed by the Rubber Manufacturers Association. For the first time in history, it says, annual rubber consumption topped the 1,000,000-ton mark. Approximately 37% natural rubber and 63% synthetic rubber were used. During the preceding year the industry used 12% natural and 88% synthetic rubber of the GR-S type.

In addition to tires for passenger cars, 13,680,000 casings were made for trucks and buses. This is 92% above the best previous peacetime record. Passenger tire production was approximately one-third greater than in 1940.

By and large, the Association states, rubber manufacturers escaped any major production stoppages during the year, though these were frequently threatened by scarcities of raw materials and components.

*Science News Letter, January 25, 1947*

## ASTRONOMY

# Orion Shines at His Best

Most brilliant constellations are seen February evenings, with stars in and around Orion, the warrior, high in the south.

By JAMES STOKLEY

► WITH February arriving, the brilliant group of stars in and around the constellation of Orion, the warrior, are in their best position, high in the south. To identify these it is a good idea to start with the three stars in a row that form Orion's belt. Above them is Betelgeuse, which marks one of his shoulders, while below is Rigel, in one of his legs.

Following the direction of the belt stars downward and to the left brings us to Sirius, the dog-star. Part of the figure of Canis Major, the great dog, Sirius is the most brilliant star in the sky, except for the sun. By tracing the line from the belt the other way, upwards and to the right, Aldebaran is located. Characteristically red in color, it is the eye of Taurus, the bull, which is charging on Orion.

## Canis Minor

The lesser dog, Canis Minor, is above the big one and contains another bright star, Procyon. Still higher is the constellation of Gemini, the twins, in which Pollux appears. Next to Gemini, toward the east, is Cancer, the crab. Though this group contains no bright stars, it is now made brilliant by the presence of a first magnitude planet, Saturn. Continuing on to the left of Cancer we find Leo, the lion. Part of this aggregation of stars has the shape of a sickle, and at the end of the handle of that implement is the star Regulus.

Still another first magnitude star is shown on the accompanying maps, on which we see the appearance of the heavens at about 10 o'clock on Feb. 1 and an hour earlier in the middle of the month. This first magnitude star is Capella, in Auriga, the charioteer. It is shown at the top of the map for the northern half of the sky, as it is nearly overhead at the times indicated.

After midnight another planet, even more brilliant than Saturn, comes into view. It is Jupiter, which is now in the constellation of Libra, the scales. As it is brighter than any other star or planet

then above the horizon, it will not be hard to identify. The moon passes close to Jupiter on the night of February 12. Just before sunrise Venus, which is brighter still, can also be seen, low in the southeast.

The planet Mars is too nearly in the direction of the sun to be seen at all, but Mercury, closest of all to the sun in miles, reaches its farthest east of the sun on February 20. For a few days about then it may be possible to get a glimpse of it in the evening twilight, low in the southwest, just after the sun has gone down.

If you watch toward the east after Jupiter appears late at night, you will soon see a bright reddish star, which is Antares, in Scorpio, the scorpion. Now it rises in the early morning hours, but in the summer-time we see it in the evening. If, when Antares has risen, you look for Orion, which was so conspicuous earlier, you will not find it for the warrior has set.

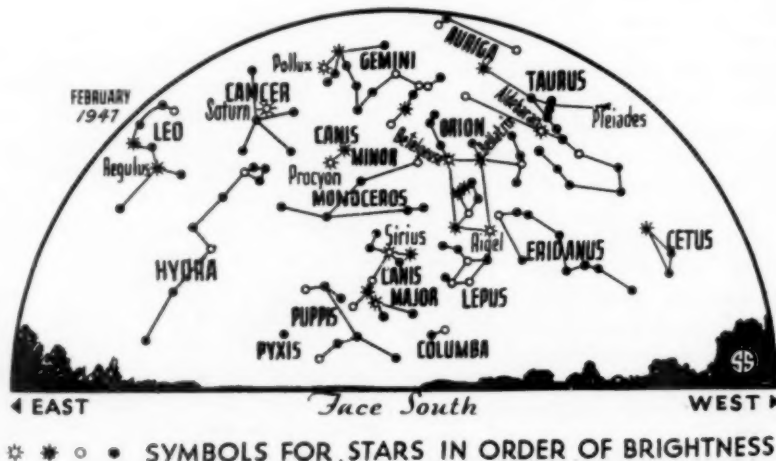
One of the old myths of the stars has an explanation for this. It seems that Orion, a great hunter, once boasted that there was no animal on earth he could not conquer. As punishment for his vanity a scorpion came out of the ground and stung him fatally on the foot. However, his friend Diana, the moon-god-

dess, interceded with Jupiter to have him placed in the sky. The scorpion was placed there too, but in the opposite direction, so that the two could never be above the horizon together. So now we see Orion on winter evenings, while the scorpion takes his place in the summer-time.

However, it is a curious fact that this will not always be so. There is a slow movement of the heavens called the precession (not procession) of the equinoxes. At present the north pole of the earth points toward the constellation of the lesser bear, Ursa Minor, close to the star we call Polaris, the pole star. But the pole does not remain in this direction. In the course of about 26,000 years it will have described a large circle in the sky, and will have pointed to a number of other stars. About 12,000 years from now Vega, the bright star in Lyra, the lyre, which we see overhead on summer evenings, will be the pole star. Going backwards we would find that several thousand years ago, when the Great Pyramid of Cheops was built in Egypt, a star we call Thuban, in Draco, the dragon, marked the pole.

## Determining Season

It is the tilt of the pole toward or away from the sun that determines when we have winter or summer. At this time of year the north pole tilts away from it, the sun is low in the northern hemisphere and we have winter. Six months from now, as it tilts in the direction of the sun, that body climbs higher in our



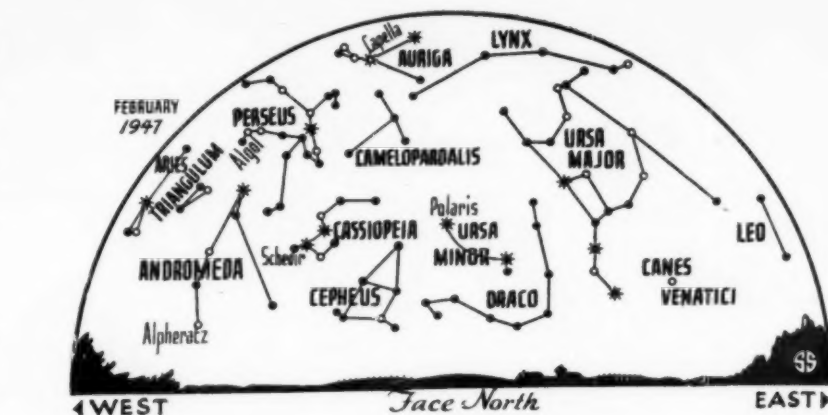


sky and we have summer. It so happens that when we have winter, the sun itself is in the direction of the scorpion, and that is why we cannot see it, though we can see Orion, which is in the opposite part of the sky. In June, when the sun is toward the part of the sky in which Orion stands, we cannot see him, but the scorpion is visible all night.

### Precession Moves Pole

In about 12,000 years precession will have moved the pole through half of its circle. Then when the sun stands toward Orion, and the scorpion is visible at night, the north pole will tilt away from the sun, so that time of year will be winter. Summer will come, as now, when the north pole tilts sunward, but then Orion will be visible in the southern sky in the evening and the scorpion will be too nearly in the same direction to the sun to be seen.

Also, at that remote date, the winter scorpion will be as high in the evening sky as Orion is now, and that warrior, like Scorpio in 1947, will stand just above the horizon. That will permit people in the United States, or whatever nation occupies this part of the world, to appreciate the beauty of the scorpion. It is really a fine group that does not appear to us in its full glory because it is so low. If, in the summer, you travel



toward the equator, you can see it overhead in its full splendor.

### Celestial Time Table for February

Feb.	EST	
3	6:00 p.m.	Moon nearest, 224,400 miles
4	3:07 p.m.	Moon passes Saturn
5	10:50 a.m.	Full moon
12	4:58 p.m.	Moon in last quarter
	10:44 p.m.	Moon passes Jupiter
15	4:00 p.m.	Moon farthest, distance 251,700 miles
16	5:58 p.m.	Moon passes Venus
17	4:37 a.m.	Algol (variable star in Perseus) at minimum
20	1:26 a.m.	Algol at minimum
	9:00 p.m.	New moon
	10:00 p.m.	Mercury farthest east of sun
22	10:16 p.m.	Algol at minimum
25	7:05 p.m.	Algol at minimum
28	4:12 a.m.	Moon in first quarter

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, January 25, 1947

or three decades preceding the war.

Science News Letter, January 25, 1947

### ENGINEERING

## Mammoth Steam Turbine Generators in Making

► MAMMOTH STEAM turbine generators for electric power companies, two in the 125,000-kilowatt class and two in the 100,000-kilowatt class, are under construction by General Electric Company. They are expected to have very high efficiency.

The two larger machines, with cross-compound turbines, will utilize steam at 2,000-pound pressure and 1,050 degrees Fahrenheit temperature. The high-pressure unit will operate at 3,600 revolutions per minute, and the low-pressure unit at 1,800 revolutions.

In the 100,000-kilowatt generators, one will operate at 1,500-pound pressure and 1,050 degrees temperature; the other at 1,250-pound pressure and 1,000 degrees temperature. Recent advances in seals and gas-purification methods will permit smaller hydrogen-cooled units in all four turbine-generators. Practically all turbine-generators of 15,000 kilowatts and over are now hydrogen-cooled.

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### GEOGRAPHY

## Strategic Spitzbergen

► THE IMPORTANCE of Spitzbergen in world strategy is emphasized again in the recent reported request of the Soviet Union to Norway for permission to use this northern island in the Arctic ocean for a military base. Hitler recognized its importance when he sent Nazi forces against it in 1943.

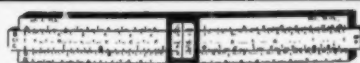
Spitzbergen is a group of bleak mountainous islands, possessions of Norway since 1925, that is located nearly half way from Norway itself to the North Pole, and some 300 miles east of Greenland. Military bases on one of them could play an important part in the control of shipping passing north of Norway to Finland and Russian ports, and perhaps offset military bases established by any other nation on Iceland. Spitzbergen also has value as location for a weather station, and it is on the Great Circle route by way of the North Pole from Europe to Alaska.

The Norwegians call the island group

Svalbard. Spitzbergen, or Svalbard, is applied usually to the main island of the archipelago. This island has some 25,000 square miles of area. It was once noted for the whale fishing in its vicinity, also for walrus fishing. In recent years its particular value has been its coal mines, from which about 700,000 tons have been taken each year.

Spitzbergen is too far north to produce foodstuffs. Its climate is not as severe as might be expected, however, as its western coast is warmed by the North Atlantic drift. It is less severe than the climate of corresponding Greenland. Vessels may approach the west coast during most of the year.

Amundsen and Byrd used a base on Spitzbergen in 1926 from which they took off to reach the North Pole. Wilkins used it in 1928 for his flight over the pole to Alaska. Scientific expeditions used the island for many exploratory trips in Arctic regions in the two



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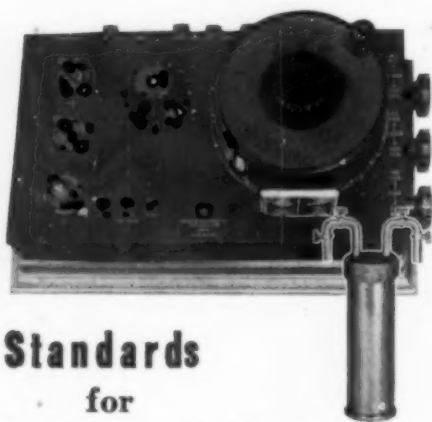
*Tin-zinc* alloys have been developed for coating steel to prevent rust.

In China only military vehicles can be green in color, and only fire equipment painted red; hospital cars and ambulances are white.

When rain wets coal in transit in coal cars, a sulfurous acid is sometimes generated that corrodes the metal sides of the cars.

Scrap metal is still wanted; American steel mills require over 2,000,000 tons a month of scrap iron to mix with an equal amount of pig iron to make structural steel.

Haslenut bushes can be grown as ornamental shrubs in many parts of the United States; they are easy to grow, have little preference to soils, and five-year-old bushes often yield three quarts of shelled nuts.

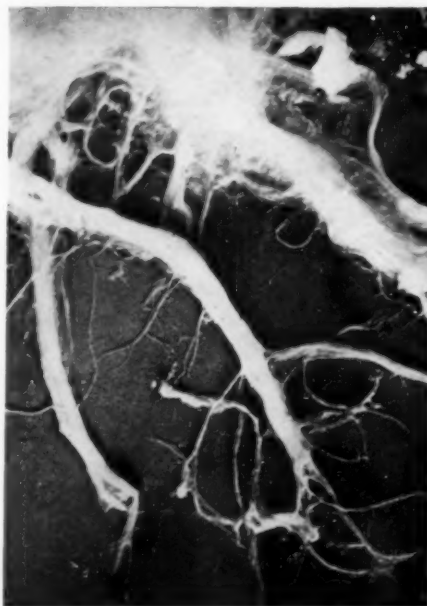


## Standards for Instrument Calibration

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**TINY FIBRILS**—Ground wood pulp structure revealed under an electron microscope.

### PLANT PHYSIOLOGY

## Wood Fibers Break Into Tiny Fibrils

► WOOD FIBERS, from which paper, explosives and lacquer are made, break into thin fibrils of rod-shaped particles as they are worn away. Fibers such as ramie and rayon, on the other hand, tend to split lengthwise at first, then break up in a haphazard manner when ground in water.

To study just how fibers disintegrate, Dr. P. H. Hermans, director of the Institute for Cellulose Research, Utrecht, Netherlands, ground several varieties in water. He then photographed the worn-down fibers with an electron microscope.

Only in the case of wood pulp are details of a fine structure inside the finest fibrils more or less distinctly visible, Dr. Hermans reports in the *Textile Research Journal* (Nov.).

*Science News Letter, January 25, 1947*

### GENERAL SCIENCE

## Mechanizing Exploration

► MECHANIZED exploration of the Antarctic may become possible as result of tests to be conducted by the Navy's expedition under the technical direction of Rear Adm. Richard E. Byrd, the Navy said.

Equipment for compacting snow for the use of vehicles and methods for preparing vehicles for use in the snow are scheduled for tests. The equipment was designed by engineers of the Navy's Bureau of Yards and Docks. Other experiments to aid overland travel in Antarctica will include determination of the differences in the properties of snow and ice at the extremely low temperatures of the polar regions compared with their properties in the temperate zones.

With the results of the experiments, engineers hope to design vehicles to replace the traditional dogsleds used in polar exploration. The present Byrd Expedition's attack on the problem of land travel on the wastes of the Antarctic will include devices for compacting the snow for vehicles to operate on top of the cold, white surface.

Drier and more powdery than the snow that falls in the United States, the polar snow becomes a blinding swirl dangerous to a traveler from the slightest gust of wind.

Some of the scientific problems to be tackled with special instruments on the current expedition are load tests, penetrometer readings, compression, bending, punching and shear tests of the ice or snow.

Two variations of a German model slat snow roller, a standard sheepfoot roller, groups of pontoons and snow drags will all be tested for use in compressing the snow for travel.

For possible use on airstrips, a snow surface heater has been designed to convert the snow into ice. A tractor pulls a compressor and heater on toboggan runners with a fuel oil tank mounted on top. By melting the snow so it can form ice, this equipment is expected to provide a fast method of preparing the surface of an airstrip with solid ice.

Lengths of wood, operating on the same principle as snow shoes, will be tried for surface transportation. They will be used on tractors to distribute the weight on the snow surface.

Jeeps and other vehicles to be used in Antarctic travel will profit from wartime designs for enclosures. Use of plexiglass, windshield wipers and asbestos insulation will protect polar travelers.

*Science News Letter, January 25, 1947*



## GENERAL SCIENCE

# Guided Missile Research

Dr. Karl T. Compton leads the Joint Research and Development Board committee studying research and development programs on guided missiles.

► PLANNING for the nation's research and development programs on guided missiles is being done by a Joint Research and Development Board committee under the temporary chairmanship of Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, the board disclosed.

The committee, which includes both civilian and military scientific leaders, is charged with the "continuing study, evaluation, improvement, and allocation of research and development programs on guided missiles in relation to the overall aims of the national defense effort and to the available and potential store of scientific information, personnel and facilities, leading to the formulation of an integrated program in this field," it was stated.

Each of the four Army and Navy groups which have been most concerned with the guided missiles program is represented on the committee by high-ranking officers. They are Vice Adm. A. W. Radford, deputy chief of Naval Operations for Air; Vice Adm. G. F. Hussey, Jr., chief of the Navy's Bureau of Ordnance; Brig. Gen. A. R. Crawford,

of the Army Air Forces; and Brig. Gen. H. B. Saylor of Army Ordnance. In addition to Dr. Compton, civilian members of the guided missiles group are Dr. H. L. Dryden of the National Bureau of Standards and Dr. E. R. Gilliland of the Massachusetts Institute of Technology. Four officers have been designated deputies to the Armed Forces representatives, while six associate members and two alternates were also named from the Army and Navy.

The Joint Research and Development Board, of which Dr. Vannevar Bush is chairman, was created last August as an inter-service coordinating group for scientific research and development and is an agency of the Secretaries of War and Navy. Prior to its establishment, the Joint Chiefs of Staff appointed a Committee on New Weapons and Equipment, with responsibility for the coordinating work. Under the chairmanship of Dr. Bradley Dewey, this group made recommendations on guided missiles which have been turned over to the new group.

It was revealed that the committee on guided missiles held its first meeting Dec. 19.

*Science News Letter, January 25, 1947*

## ENGINEERING

## Oil Field Brines May Yield Magnesium

► OIL FIELD brines may be expected as a source of magnesium, the American Society of Civil Engineers was told by Ogden S. Jones of the Kansas State Board of Health.

These brines come in drilling for oil wells when deep-seated salt waters are tapped. They may have concentrations of chlorides and solids of from six to seven times that of sea water. The accepted practice where such brines are now raised to the surface is to put them deep under ground in special wells so that they will not pollute fresh water streams.

It would require 400 barrels of chlorine-free water to dilute one barrel of this brine so that it would comply with

the standards of the U. S. Public Health Service, Mr. Jones said.

After describing various methods utilized for the disposal of brine, mostly without any attempt to salvage the salts contained, Mr. Jones warned that the water supply of the nation is not limitless. We are using more water than formerly and putting less back into the ground. This condition cannot keep up indefinitely, he said, urging a program of water conservation and public action to prevent stream contamination.

The need of a federal law to coordinate the activities of the state stream pollution control units was stressed by Don E. Bloodgood of Purdue University. Nearly 100 bills have been introduced into the Congress in the past 50 years, he said, but none has passed due to the failure of conservationists and public health officials to agree.

*Science News Letter, January 25, 1947*

## PHYSICS

## Electronic "Stopwatch" Times Atomic Particles

► THE SPEED of atomic particles can now be measured to one thousandth of a millionth of a second. A new electronic "stopwatch" developed in Yale University laboratories measures intervals as brief as that.

In addition to measuring the speed of atomic particles, it counts them also, and determines the energy of the charged particles in nuclear reactions. It is a combination of conventional radio vacuum tubes and other standard electrical equipment.

Its operation depends upon the synchronization of electrical counters which detect an electrical pulse in the circuit. The timing is accomplished by measuring the amount of delay inserted in the circuit in order to synchronize the counters.

*Science News Letter, January 25, 1947*

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Winter Guests

► WINTER BIRDS do not have too hard a time of it in ordinary winter weather. Chickadees and nuthatches and their cheerful little kindred are used to cold weather—even seem to like it, for they do not fly on farther south as they easily might. They make a pretty good living by prying insect pupae and egg masses out of crevices in the bark of trees, harvesting the seeds of weeds that stick up through the snow, and exploiting other sources of food that human beings would never think of.

Heavy snowfalls, especially if they are followed by light rain or partial thaw that puts a hard crust of glaze-ice on top, are apt to make life difficult on even the hardest of "snowbirds." All but the tallest weed stalks become inaccessible, and the scattered food on the ground, which the birds can see even if we cannot, is sealed down tight.

At such times putting out food for the birds becomes a real act of mercy. Nor should you forget to put out a dish of water a couple of times a day, warming it up to the temperature of your own coffee so that it will last longer before it freezes over.

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VISUAL SCIENCES

599-S—SUFFERN, N. Y.

Feeding may be as simple as you like—even table crumbs scattered on the snow will help a lot of birds. However, if the snow is loose this is rather wasteful, for much of the food will sink out of sight and be lost. It is better to rig up some kind of feeding tray, preferably with a board for windbreak on the weather side. Also, it is possible to put your tray on top of a post, or in some other position out of the reach of cats.

Whatever else you may feed your birds, don't forget to provide lumps of suet. Birds in winter need lots of calories to keep their small selves warm, and suet is one of the most concentrated sources of bodily energy that can be offered. Even with the price of meat as high as it is, you can afford a bit of suet for the

birds occasionally.

It is best not to leave the suet lumps loose on the feeding tray, lest jays or other large birds fly off with them bodily, leaving nothing for later comers. Nail your suet to a tree, or string it on a thick wire or stout cord big enough to give small birds foothold.

One ingenious woman used an old wire soap-holder to make a one-mouthful-at-a-time suet-holder. She fastened one side down loosely with staples, so that it would turn as on hinges. For the other side she arranged a rough latch of wire. This made the provisioning of suet a task she could take care of in a few seconds, and she always had birds to watch through her kitchen window.

*Science News Letter, January 25, 1947*

## SOCIOLOGY

# Marriage Rate Increases

► ABOUT a million and a half more men and women made a trip to the altar last year than in 1945.

During the first ten months of 1946 almost 50% more couples were married in the large cities of the United States than during the same months of the preceding year.

The number of marriages rose in all parts of the country. Large cities in New England showed a 53% increase from 1945 to 1946. The corresponding gain for the Middle Atlantic states was 59%. The marriage rate for large cities in the East North Central states was up 66%.

The smallest increase in marriages in 1946 as compared with the preceding year, the last war year, occurred in the Far West, where the marriage rate was maintained at a high level throughout the war period, statisticians of the Metropolitan Life Insurance Company report.

Marriages in the cities of the Mountain and Pacific states last year were only 13% higher than during the preceding year. The South Atlantic states recorded next to the smallest increase, but even so they showed a 22% rise for the year.

During the first six months of 1946, a total of 1,165,175 marriage licenses was issued, as compared with 718,316 from January through June of 1945, records of the National Office of Vital Statistics, U. S. Public Health Service, show. In all of 1945 only 1,632,156 licenses were applied for.

During the first 11 months of 1946, over 716,000 couples applied for marriage licenses in cities of 100,000 or over, comprising about one-third of the total population of the United States.

The previous peak marriage year was 1942, our first year at war. The gains in the large cities in 1942, however, were concentrated in the South and the West, while the number of marriages in urban centers of the Northeast actually decreased.

*Science News Letter, January 25, 1947*

## VETERINARY SCIENCE

# Birds Can Be Infested With Barnyard Disease

► LARYNGOTRACHEITIS, a disease which wreaks havoc in American barnyards, is easily transmitted to birds, Dr. K. B. DeOme, University of California veterinary scientist, reported at the meeting of the Pasteur Society of Central California.

Three minutes' exposure to air containing droplets of the virus of this disease consistently produced clinical cases in birds, he found.

Fifteen minutes' exposure to virus-bearing dust on chick down caused infection, with no help in preventing it from glycol vapors or ultraviolet radiation. Air-borne cross-infection of birds was produced in three hours' exposure in spite of glycols and ultraviolet.

*Science News Letter, January 25, 1947*

Ether has been used as an anesthetic for a century.



# Books of the Week

**ARCHAEOLOGY OF ALKALI RIDGE, SOUTHEASTERN UTAH:** With a Review of the Prehistory of the Mesa Verde Division of the San Juan and Some Observations on Archaeological Systematics — John O. Brew — *Peabody Museum*, 346 p., illus., \$4.25, paper; \$10, cloth. Vol. XXI.

**THE BIRDS OF NORTH AND MIDDLE AMERICA:** A Descriptive Catalog — Robert Ridgway and Herbert Friedmann — *Govt. Printing Office*, 484 p., illus., paper, \$1.25. Smithsonian Institution, U. S. Natl. Museum Bul. 50.

**CHEMISTRY FOR THE EXECUTIVE:** A Layman's Guide to Chemistry — Ralph K. Strong — *Reinhold*, 445 p., illus., \$6. An informal presentation of the study of chemistry by means of a series of interviews between the executive and the author.

**COMMERCIAL BROADCASTING PIONEER:** The WEAF Experiment 1922-1926 — William P. Banning — *Harvard Univ. Press*, 308 p., illus., \$3.50. The story of the pioneering effort which proved how nation-wide broadcasting as a public service could be financially supported.

**FUNDAMENTALS OF SEMI-MICRO QUALITATIVE ANALYSIS:** Carl J. Engelder — *Wiley*, 385 p., \$3.50. A textbook that places emphasis throughout on integration of theory, laboratory work and problems.

**HOW TO TAKE PHYSICAL INVENTORY:** Richard F. Neuschel and Harry T. Johnson — *McGraw-Hill*, 159 p., \$2. A practical guide presenting the principles and techniques for planning and taking a physical inventory.

**THE NEW FIBERS:** Joseph V. Sherman and Signe L. Sherman — *Van Nostrand*, 537 p., illus., \$5. Information about new fibers, together with supplementary data on applications.

**PHYSICS TELL WHY:** Atomic Energy Edition — Overton Luhr — *Cattell*, 387 p., illus., \$3.75. An explanation of some common physical phenomena such as radar, atomic energy, jet-propelled planes, etc.

**SPEEDLIGHTS:** Construction and Use — Arthur Palme — *American Photographic Publ. Co.*, 128 p., illus., \$2.50. All the necessary information for those who wish to home-assemble a useful speedlight with all of its individual parts readily available.

**TAKE A NUMBER:** Mathematics for the Two Billion — Lillian and Hugh Lieber — *Cattell*, 221 p., illus., \$2.75. Written in an engaging style with drawings to describe the fundamentals and practical use of mathematics.

**TEXTBOOK FOR PSYCHIATRIC ATTENDANTS:** — Laura Fitzsimmons — *Macmillan*, 332 p., \$3.50. A textbook for use in training attendants in mental hospitals.

**VITAMINS AND HORMONES:** Advances in Research and Applications, Vol. IV — Edited by Robert Harris and Kenneth Thimann — *Academic Press*, 406 p., illus., \$6.80. The latest volume in this series indicates in three of the review articles the present trend toward increasing interrelationship between vitamin and hormone research.

*Science News Letter, January 25, 1947*

Dr. Klein, who is now at the Kellogg Institute, Ann Arbor, Mich., in *Science*, (Jan. 17).

*Science News Letter, January 25, 1947*

## INDUSTRY

### New Mechanical Invention Shoots Grains From Guns

► THE "GRAINS shot from guns" familiar through breakfast-food ads have been put on an automatic, continuous-production basis by a machine on which U. S. patent 2,414,185 has been issued to Edward D. Andrews of Akron, Ohio.

A battery of eight of the steam guns are arranged, breech to breech, around a hollow rotating shaft which is also the steam duct. As they turn like the spokes of a slow wheel, each muzzle receives a charge of the food to be processed, through an automatic hopper. Then a closing device is clamped on and the steam pressure built up. As the muzzle comes around almost to the starting-point, the action of a cam suddenly releases the muzzle-stopper and the gun discharges its now well-steamed contents into a funnel-bottomed receiving chamber, from which it flows to the packing room.

Rights in the patent have been assigned to the Quaker Oats Company.

*Science News Letter, January 25, 1947*

## DENTISTRY

### Caries Agents in Water

► DRINKING WATER may contain substances that make teeth more vulnerable to decay.

Evidence for this was discovered by Dr. Henry Klein, U. S. Public Health Service dental researcher, in examinations of the teeth of more than 3,000 New Jersey school children. These were made with the cooperation of Dr. J. M. Wisan, New Jersey health department's dental chief, and Dr. John F. Cody of the U. S. Public Health Service.

The children lived in five communities of southern New Jersey. In three of these communities the water supplies contained enough fluorine to favor resistance to tooth decay. In the other two, the water was considered fluorine-free.

Of the 3,000 children, 1,307 had been born outside the five communities and moved into them at various ages. Of those moving into the fluorine communities, the younger the child was at the time he arrived there and the longer he

lived there, the less his teeth were attacked by decay. This showed the now generally recognized effect of fluorine in drinking water in favoring resistance to tooth decay.

By contrast, among the children moving into the fluorine-free areas, the most recent arrivals had the best teeth while those who had lived in the area the longest had the worst teeth so far as decay was concerned.

Scientists are now actively searching for the substances in the water of the communities that make teeth more vulnerable to decay. Superficial examination shows that the nonfluoride waters in the communities are acid enough to need treatment with alkali and that they contain so much excess iron that it is necessary to aerate the water to remove it. An unusually high content of nitrates has also been found in these waters.

Details of the study are reported by

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# • New Machines and Gadgets •

❁ **BABY BOTTLE warmer**, with a plastic base to hold the bottle upright, uses household electric current with a heating element that does not break, burn or short-circuit. The outside of the heater can be touched without danger of burns.

Science News Letter, January 25, 1947

❁ **ELECTRIC light bulb**, flaring to twice or more the width of the ordinary globe-shaped bulb, provides both direct and indirect lighting. The top flat end diffuses light upward through a special frosting, while other light diffuses downward through an opalescent coating on the sides.

Science News Letter, January 25, 1947

❁ **COLD STORAGE box** for airplane shipments is a four-foot cube insulated with fiber glass and cooled with dry ice. When containing six slabs of the solidified carbon dioxide, 10 inches square and one inch thick, the inside temperature is lowered 80 degrees Fahrenheit and held so for eight hours.

Science News Letter, January 25, 1947

❁ **ELECTRONIC metronome**, to keep time for musicians, employs a thyatron vacuum tube that gives impulses at timed intervals. A flash baton enables a practitioner to follow a beat visually, while the audible beat can be modulated from slight to high loudness.

Science News Letter, January 25, 1947

❁ **WINGED AUTOMOBILES** are used to test tires at high speeds. The wing is attached to one side of the car,



as shown in the picture, and offsets the centrifugal force of the vehicle racing around a circular track. With it, tire wear is about the same as on a straight highway.

Science News Letter, January 25, 1947

❁ **CONTINUOUS steam** still provides an economical method for producing turpentine and rosin from Southern pine sap. Pre-heated gum, or sap, is fed continuously into one end, and the two products come out the other at separate points. The new method is faster and cheaper than the batch method.

Science News Letter, January 25, 1947

❁ **CENTRIFUGAL CLUTCH**, an automobile type, is used to improve oil-

burning heating plants. It links the electric motor and air fan on one end of the drive shaft with the oil pump on the other and delays pump action until the fan is delivering sufficient air for complete combustion.

Science News Letter, January 25, 1947

❁ **WORKSHOP UNIT**, consisting of five separate machine tools, has a single electric motor that can be transferred quickly from one machine to the other. Suitable for a home shop, the unit has a lathe, grinder, drill press, router and shaper. The motor operates on either direct or alternating current.

Science News Letter, January 25, 1947

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 346. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

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## Question Box

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